Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Interference Immunity Performance Specifications for Radio Receivers	)	ET Docket No. 03-65
	)	
	)	MM Docket No. 00-39
Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television	)	
	)	

COMMENTS OF ERICSSON INC

Ericsson Inc ("Ericsson") hereby submits comments in response to the Federal Communications Commission's ("Commission") Notice of Inquiry released March 24, 2003 requesting comments regarding the merits of incorporating interference immunity performance specifications for receivers or receiver performance specifications ("RPS") into its spectrum policy. Specifically, the Commission seeks comment on the potential impacts of RPS in the marketplace. Ericsson does not support the additional RPS for the following reasons:

- Regulated RPS will lead to technology stagnation, inefficient spectrum management, and unnecessary increased costs to the industry;
- Current transmitter regulations are clear and measurable;
- Regulatory mandates that overlap or supplant industry innovations negatively impact competition in the marketplace and prevent the development of technologies that maximize spectrum efficiency;
- RPS are unnecessary and could present serious obstacles to international trade; and

- Regulated standards negatively influence the actions of equipment manufacturers, who are in the best position to respond quickly to marketplace demands and changes.

The cornerstone of the wireless industry is innovation. Through innovation, the industry has successfully brought new and advanced services and technologies to customers. In fact, according to the Commission's Eighth Report on the state of wireless industry competition, "[d]uring 2002, the CMRS industry continued to experience increased service availability, lower prices for consumers, innovation, and a wider variety of service offerings."[1] Through innovation, the industry has also successfully addressed and resolved numerous technological challenges. In particular, the industry has been proactive in resolving interference and immunity issues that affect the ability of consumers to receive services and to effectively use new devices. Ericsson is concerned that replacing industry's independent market-driven stimulus to innovate and compete with regulated RPS will lead to technological stagnation, inefficient spectrum management, and unnecessary increased costs for the industry. Ultimately, the foregoing will harm consumers who will likely experience a decrease in the availability of, and an increase in the cost of, novel products and services.

[1] *In The Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, Eighth Report,* FCC 03-150, released July 14, 2003, p. 11

A. Transmitter Regulations Are Adequate.

The Commission has long been concerned with signal interference. Interference compromises wireless services and causes performance degradation, misinterpretation, or loss of information, among other negative consequences.[2] To date, the Commission has addressed interference concerns in a manner that enables industry to continue to innovate. The Commission has established operation parameters, such as signal strength limitations, maximum transmitter power, antenna height, and out of band emissions.[3] These transmitter specifications are adequate and do not need to be altered or supplanted with RPS.

Industry shares the Commission's concerns regarding interference. It has always been a goal of industry, with each new technology and each new product design, to explore and implement opportunities to maximize device immunity and to minimize interference. The Commission's existing regulations set forth clear parameters that enable industry to predict the environment in which products must be able to function. In turn, industry is able to design and deploy products that innovatively satisfy operational and emissions requirements.

Current transmitter regulations are clear, measurable, and can be incorporated into product design. In fact, industry has developed a comprehensive protocol for ensuring that products satisfy the Commission's requirements. At the design stage, industry can incorporate emissions specifications and can test whether a transmitter interferes with other radio systems in adjacent frequency channels. Further, industry has established several measurements to verify that power amplifiers do not render adjacent frequencies

[2] NOI ¶ 4
[3] NOI ¶ 7

unusable. These metrics determine the amount of power present in the adjacent or alternate frequency channels due to nonlinear interaction between the power amplifier and a modulated spectrum and provide indications to manufacturers to correct unacceptable power levels. If a product fails to comply with the Commission's requirements at the design stage, it can be modified and retested before production begins.

Moreover, before commercial release of a product, the manufacturer must certify the product's compliance with the Commission's regulations and standards. These regulations and standards include whether the transmitter is on the correct frequency and not interfering with others, whether it is operating at the correct output power, and whether the emitted spectrum has the required shape. Transmitters must also transmit on the correct frequency, without drifting, to meet regulatory requirements and to enable rapid signal acquisition by the receiver. The appropriate power levels and performance parameters have been identified by the Commission and incorporated into the Commission's rules, which adequately ensure that transmitters function as intended and do not unacceptably interfere with other signals. Thus, the regulations in place are sufficient to address interference issues. In light of these regulations, defining additional RPS is a redundant and unnecessary regulatory exercise.

B. Receiver Immunity Performance Specifications Will Negatively Impact Innovation and the Marketplace.

The Commission requests specific comment on the impact that RPS would have on innovation, product design, performance, and features. Ericsson is concerned that RPS would negatively impact innovation and the marketplace by interfering with the processes already in place and at work in the industry. Industry has been especially successful in independently developing new technologies that maximize spectrum efficiency. Industry's innovation is driven by the marketplace reality that new products must be increasingly more efficient and more advanced to compete effectively and attract new customers. Regulatory mandates that overlap or supplant effective industry efforts are likely to interfere with industry's ability to respond to the needs of the market and thereby cause less product innovation and less competition in the marketplace.

It is undisputed that the airwaves are becoming increasingly more crowded. Wireless systems are using a number of different techniques, ranging from spread spectrum and frequency hopping to digital modulation and smart antennas to provide service within the spectrum that is available. These are all technological innovations that have occurred directly in response to a thriving marketplace and without RPS in place.

If there is a true demand in the marketplace for more immune receivers, manufacturers will be spurred to innovate and develop appropriate services and products. Presently, mobile receiver manufacturers are making significant improvements in their products, particularly in the area of indoor reception and multipath signal handling capabilities. RPS would redirect the focus of manufacturers' research and development efforts and would impede the progress of these, and other, innovations. Industry resources would be diverted to identifying and deploying "lowest common denominator

solutions," i.e., ways in which manufacturers can satisfy the regulatory requirement at the lowest cost. In this situation, market forces (consumer demand) are essentially taken out of the equation. Supplanting market forces with RPS is a poor policy decision that will undermine the vitality of the consumer market as well as consumer confidence in mobile products.

Moreover, equipment manufacturers are, historically, in the best position to respond quickly to marketplace demands and changes. In the face of regulated RPS, the focus of manufacturers becomes compliance with the standard. Manufacturers, however, cannot, because of finite resources and manpower, continue to pursue new and innovative ways to improve performance. Thus, the costs of producing compliant products are great and include loss of innovative products, decrease in product choice, and an increase in equipment costs as compliance expenses are incorporated into equipment prices.

Further, a standard creates a false sense of security and stability in the management of spectrum use. With RPS in place, the Commission may authorize additional uses in allocated or unallocated spectrum ostensibly to maximize its utility. Such efforts could introduce additional sources of interference, without a true understanding of their effects under the guise that such interference is "okay" as long as receivers incorporate minimum immunity performance requirements. In this situation, the short term direct benefit of compliant products (if any) is likely to be lost because any current mandate cannot account for as yet unidentified additional sources of interference. Accordingly, rather than fixing or curing interference concerns, RPS may actually exacerbate interference conditions. Implementing immunity specifications without a clear benefit to consumers is ill-advised and serves only to deflect limited resources away

from more deserving projects for which a clear consumer demand exists. Therefore, the Commission should not establish RPS.

C. The Commission Does Not Need to Establish Technical Performance Parameters.

In its Notice of Inquiry, the Commission seeks to increase the role that technology plays in its spectrum management policy. For example, the Commission makes special note of the technological advancements in the ability of devices to reject unwanted signals as well as the increased filtering capacity of radio receivers.[4] The Commission concludes that these advancements present an opportunity to increase spectrum sharing and reduce the need for the Commission to adjudicate interference claims. However, the Commission's focus on technology as the "problem" solver is misplaced. Technical performance parameters that are driven by today's technology are not the answer and inappropriately institutionalize current technology to the detriment of future innovation.

The interference environment is highly variable and depends on many parameters including the characteristics of the frequencies and equipment used to transmit signals and the service being offered. Because of these variances, any RPS established by the Commission would likely not be universally applicable. Instead, to ensure that RPS matched the characteristics of a particular performance environment appropriately, each environment with all its varied conditions would need to be studied and quantified. Only after extensive examination could the Commission promulgate RPS with a reasonable degree of certainty that the RPS were appropriate for a given performance parameter. Otherwise, the immunity specifications promulgated by the Commission would be inadequate from the outset.

[4] Separate Statement of Chairman Michael K. Powell, attached to NOI at p. 20.

In addition, equipment is designed to operate based on the licensing conditions and the environment known at the time of design. Current equipment design takes emission and immunity considerations into account. If the Commission establishes RPS, all equipment will be designed to these specifications to the exclusion of others. In addition, certain design trade-off decisions would likely need to be made. Such tradeoffs would likely involve sacrificing features desired by consumers in order to comply with RPS requirements. As a result, the technology choices would be limited and current technology would inappropriately substitute for sound spectrum management policy that is technology neutral, fosters innovation, and is forward looking. To avoid this result, the Commission should not establish such technical performance parameters.

D. Receiver Interference Immunity Performance Guidelines and Standards Should Not be Incorporated into Spectrum Policy.

The Commission envisions three principle approaches for incorporating RPS into its spectrum policy. These approaches include voluntary standards, guidelines (either as Commission advisories or as technical publications), and mandatory rules. Each of these approaches is unnecessary and should not be instituted.

First, mandatory product standards represent the worst possible approach and should not be applied. Besides being unnecessary, such standards could present significant obstacles to international trade, especially for those products that are developed for and deployed in numerous markets. For instance, global suppliers of wireless equipment have been able to achieve some degree of "economy of scale" by sharing solutions across many models that are sold in many markets across the globe. If the Commission creates a unique market that requires deviation from this sharing of

common solutions, equipment for the U.S. market will cost more to create. Ultimately, equipment available to U.S. consumers will be more expensive.

In addition, the creation of a unique market may have the undesirable consequence of preventing global circulation of equipment. At the least, creating a unique market will introduce uncertainty and cause manufacturing and distribution delays. Neither consequence is in the public interest. Moreover, as discussed above, the scientific information and evidence for establishing rational and reasonable standards is lacking. Therefore, mandatory standards that incorporate unnecessary regulations will impede market innovation and decrease the availability of technically advanced economical products. In fact, mandatory product standards could produce a unique market, which can only be served by a limited product pool.

Second, voluntary standards, like mandatory standards, may also pose problems for international trade for similar reasons. If immunity standards differ significantly from country to country, manufacturers are likely to seek to develop a one-size-fits-all product that may not incorporate the desires of a specific market. Customer choice is narrowed and consumers are denied the benefits of new technologies.

Moreover, because modern manufacturing is often an assembly of parts and components manufactured across the globe, the distinction between voluntary and mandatory standards may be illusory. For instance, from the perspective of suppliers, procurement specifications set by major manufacturers are as mandatory for doing business as performance goals established by government agencies. Accordingly, voluntary standards become mandatory in practice.

When the number of different specifications that are viewed as "mandatory" increases, manufacturing costs rise and economies of scale are lost as each product line is manufactured to separate and distinct specifications. The practical effect of "voluntary" specifications is restriction of international trade. Consumers are unnecessarily deprived of access to the full range of advanced products and innovative features; there is an ever smaller group of compliant products available for import. In addition, prices are unnecessarily inflated because there are fewer services for compliant equipment.

Third, technical regulations or advisories are inappropriate because they are not intended to address the multitude of issues concerning immunity specifications. Technical regulations are not like voluntary or mandatory standards, where the aim of the standard is limited and specific, i.e., to establish measures for implementing RPS. Technical regulations or advisories are imposed to satisfy a variety of policy objectives, including prevention of deceptive practices and protection of the environment. They are ill-suited for establishing definitive immunity specifications for an entire sector of the wireless industry. Therefore, the Commission should not rely on technical regulations or advisories to establish RPS.

Ericsson does not support any of the foregoing approaches as each is fraught with problems. In addition to their specific problems, all three approaches present the added challenge of determining compliance with the standard or advisory once it is established. Generally, to ensure compliance, a certification system would need to be developed. Such a system would need to incorporate inspections and analyses of products with the goal of deciding whether or not the product is approved, i.e. is granted a mark of certification or quality.

A certification process is onerous and expensive. Certification costs add to the baseline costs of equipment associated with product development, manufacturing, and marketing costs. These costs include prior product type approval, factory inspections for quality control assessment, packaging, marking and labeling expenses, testing, transportation, storage, and installation expenses. Even with steps designed to minimize compliance and certification costs, there are likely to be transition costs as manufacturers, importers, retailers, and consumers adjust to new specifications. Transition costs also increase the cost of a device. All these added costs rapidly turn an economical device in a highly competitive market into a prohibitively expensive one. Thus, ensuring compliance with unnecessary standards, whether they are in the form of mandatory, voluntary, or technical regulations, has a significant and negative impact on the market.

There is no evidence that the overall benefits of RPS outweigh the high costs. In fact, the costs of implementing RPS could harm consumers, particularly those sensitive to first-price (as opposed to life–time) cost. Therefore, RPS will likely harm consumers, are inappropriate, and should not be imposed.

E. The Commission Should Not Implement An Ad Hoc Approach to Establishing RPS.

The Commission has suggested that it may consider promulgating RPS for or applying RPS to specific radio services.[5] In particular, the Commission has indicated that special guidelines or standards may be advisable for those services that use mobile receivers which operate on relatively narrow channels with no or small amounts of separation between adjacent channels and that use high quality receivers that are sensitive

[5] NOI ¶11

to low level signals, provide good selectivity, and are resistant to overloading.[6] The Commission should not engage in an ad hoc approach to promulgating RPS and should not single out a particular technology or a particular service. An ad hoc innovation and competition "solution" could result in an unintended technology preference and thereby stifle innovation and competition.

In addition, increasing the RPS in one service will not necessarily help the performance of an adjacent service. For example, by its very nature, Satellite service must be sensitive to low level received signals. Satellite receivers are designed and engineered to maximize their sensitivity so that service can be provided via satellite. However, because of their high degree of sensitivity to low level signals, satellite services can be adversely affected by adjacent services. Improvements in the immunity performance of an adjacent service will not improve the ability of Satellite receivers to receive a lower signal. Therefore, ad hoc approaches to immunity performance would serve only to create complicated regulatory schemes that undermine the effectiveness of the Commission's overarching spectrum management policy and have no effect on the performance of an adjacent service.

F. The Commission Should Not Establish Incentives for Existing Receivers.

As discussed above, transmitter specifications are adequate and do not need to be altered or supplanted with receiver standards which would likely only increase the costs of services and equipment for consumers. Therefore, no incentives are needed and they should not be considered as an alternative to natural market forces that spur equipment manufacturers to respond rapidly to marketplace demands and changes. Past experience

[6] NOI ¶23

demonstrates that manufacturers are quick to innovate and to bring consumers advanced products and services at competitive prices. Innovation in the marketplace, rather than artificial stimulus, is the best avenue for addressing issues of interference. In fact, the wireless market has already responded to such issues by developing and introducing new, more immune products.

Because manufacturers are successfully addressing immunity needs (an extremely powerful influence on manufacturers), it is unclear what more could be achieved through incentives. The Commission should not utilize its resources to design and describe incentives whose affect is speculative and uncertain.

G. Conclusion

Based on the foregoing, Ericsson does not support the establishment of receiver immunity performance specifications. A deviation from the present model of transmitter specifications is not wise or warranted. The result of any new regulatory mandate regarding immunity, voluntary or involuntary, is likely to stifle innovation, increase the cost of products for consumers, and reduce the variety of choices presently available to consumers without a corresponding benefit. Accordingly, Ericsson respectfully recommends that the Commission refrain from imposing any receiver interference immunity performance specifications. Instead, market forces should be allowed to continue to support innovation and preserve consumer choice.

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